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#### ABSTRACT

A method and an apparatus for generating three-dimensional maps of temperature distribution throughout a dielectric object is disclosed. The apparatus uses radiometric sensors to detect radiation from various layers within the object over a range of wavelengths from radio waves through the infrared. The radiation emissions are linked to temperatures through the use of Planck's Radiation Law, and a three-dimensional map of the temperature distribution is generated using Fridgholm integrals. The device and method has application for early detection of cancer and is non-invasive.

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